

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

REC'D 04 JUN 2004

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| Applicant's or agent's file reference A2-166PCT | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/US 03/05915 | International filing date (day/month/year) 26.02.2003 | Priority date (day/month/year) 26.02.2002 |
| International Patent Classification (IPC) or both national classification and IPC H01R13/648 | | |
| Applicant MOLEX INCORPORATED et al. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

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| Date of submission of the demand 16.09.2003 | Date of completion of this report 03.06.2004 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Chelbosu, L Telephone No. +49 89 2399-6974  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/05915**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-5 as published

Claims, Numbers

1-6 filed with telefax on 16.12.2003

Drawings, Sheets

1/4-4/4 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 - ☐ the language of publication of the international application (under Rule 48.3(b)).
 - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority in written form.
 - ☐ furnished subsequently to this Authority in computer readable form.
 - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/05915**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|-----|
| Novelty (N) | Yes: Claims | 1-6 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-6 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-6 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US03/05915

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATE OF THE ART

Reference is made to the following documents:

D1: US-A-5 167 516 (H.-C. TAN ET AL) 1 December 1992

D2: US-B1-6 305 955 (T.B.BILLMAN) 23 October 2001

D3: US-A-5 879 173 (D.S. POPLAWSKI ET AL) 9 March 1999

The document D3 was not cited in the international search report (but cited in D2, col. 1, lines 24-34). A copy of the document is appended hereto.

Document D1, which is considered to represent the most relevant state of the art, discloses an electrical connector from which the subject-matter of claim 1 differs, inter alia, in that :

F1: - the connector further comprises a metal shell about at least a portion of the housing and the coil spring has the opposite ends maintained in engagement with the conductive portion of the shutter plate and the metal shell

2. OBJECTIVE TECHNICAL PROBLEM

The problem to be solved by the present invention may therefore be regarded as to improve the dissipation of the static electricity in an electrical connector in order to avoid the damages that can be caused to interior components of the connector by said static electricity.

3. SOLUTION

The technical problem posed is solved by the features of claim 1, particularly F1.

4. NOVELTY, INVENTIVE STEP AND INDUSTRIAL APPLICABILITY

The feature F1 is neither disclosed in, nor rendered obvious by, either one of the prior art documents cited by the applicant or listed in The International Search Report.

Document D2 discloses a metal shell about at least a portion of the housing, said shell being electrically coupled with a shutter by a conductive spring, but the skilled person can not use the knowledge from D2 in D1 in order to solve the problem posed because, on one hand, the spring disclosed in D2 is not a coil spring and, on the other hand, the coil spring disclosed in D1 could not be engaged with the metal shell.

If the skilled person would combine the disclosure of document D3, as closest prior art, with the knowledge of D2 (a metal shell about at least a portion of the housing, said shell being electrically coupled with a shutter by a conductive spring), he would not come to the subject-matter of claim 1 because the spring disclosed in D2 is not a coil spring.

Therefore, the independent claim 1 meets the requirements of Article 33(2)-(3) PCT with regard to novelty, inventive step and industrial applicability in view of the available prior art.

Claims 2 -6 depend on claim 1 and therefore fulfil the requirements of Article 33(2)-(3) PCT with regard to novelty, inventive step and industrial applicability in view of the available prior art.

5. MISCELLANEOUS

- 5.1 The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT.
- 5.2 In the following claims obvious errors are present:
- in claim 4 should read "*connector of claim 3*" and not "*connector of claim 4*";
 - in claim 6 should read "*connector of claim 5*" and not "*connector of claim 6*".

AMENDED CLAIMS

Received by the International Bureau on 21 July 2003 (21.07.2003)
original claims 1-14 are replaced by amended claims 1-10 (original claims 9-12 have
been cancelled).

1. An electrical connector (10), comprising:
a dielectric housing (12) having a receptacle (24) for receiving a complementary mating
connector (62);
a plurality of conductive terminals (40) mounted on the housing and having contact
5 portions (40a) exposed in the receptacle for engaging appropriate contacts (66) of the mating
connector;
a metal shell (14) about at least a portion of the housing;
a shutter plate (32) movably mounted on the housing for movement between a closed position
substantially closing said receptacle to prevent inadvertent engagement of foreign objects
10 with the contact portions of the terminals and an open position allowing mating of said
complementary mating connector, at least a portion (50) of the shutter plate being conductive
to dissipate static electricity at the receptacle; and
at least one spring (30) mounted on the housing for biasing the shutter plate toward its
closed position, the spring being conductive and electrically coupled between the conductive
15 portion of the shutter plate and the metal shell to ground the plate to the shell.
2. The electrical connector of claim 1 wherein said spring comprises a coil spring
(30) having opposite ends (30b,30c) maintained in engagement with the conductive portion
(50) of the shutter plate and the metal shell (14).
3. The electrical connector of claim 2 wherein said shutter plate (32) is
elongated, and including a pair of said coil springs (30) located at opposite ends of the
elongated shutter plate.
4. The electrical connector of claim 1 wherein said shutter plate (32) includes a
dielectric core (48) and said conductive portion of the shutter plate comprises a metal cover
(50) over at least part of the dielectric core.
5. The electrical connector of claim 4 wherein said dielectric core (48) of the
shutter plate includes an inside face (48a) which faces the contact portions (40a) of the
terminals (40).

6. The electrical connector of claim 1 wherein at least one of said terminals is provided as a ground terminal (40A) and is in engagement with the conductive portion (50) of the shutter plate, thereby coupling the ground terminal, via the conductive spring (30), to the metal shell (14).

7. The electrical connector of claim 6 wherein said conductive portion (50) of the shutter plate (32) includes a foot (54) extending into engagement with said at least one ground terminal (40A).

8. An electrical connector (10), comprising:

a dielectric housing (12) having a receptacle (24) for receiving a complementary mating connector (62);

5 a plurality of conductive terminals (40) mounted on the housing and having contact portions (40a) exposed in the receptacle for engaging appropriate contacts (66) of the mating connector;

a metal shell (14) about at least a portion of the housing;

10 a shutter plate (32) movably mounted on the housing for movement between a closed position substantially closing said receptacle to prevent inadvertent engagement of foreign objects with the contact portions of the terminals and an open position allowing mating of said complementary mating connector, at least a portion (50) of the shutter plate being conductive, the shutter plate (32) including a dielectric core (48) and an inside face (48a) which faces the contact portions (40a) of the terminals (40) and said conductive portion of the shutter plate comprising a metal cover (50) over at least part of the dielectric core.; and

15 grounding means (30) coupled to said at least a portion (50) of the shutter plate (32) for dissipating static electricity at the receptacle.

9. The electrical connector of claim 8 wherein at least one of said terminals is provided as a ground terminal (40A) and is in engagement with the conductive portion (50) of the shutter plate (32).

10. The electrical connector of claim 9 wherein said conductive portion (50) of the shutter plate (32) includes a foot (54) extending into engagement with said at least one ground terminal (40A).